

WHAT IS CLAIMED IS:

1. A paper sheet detection apparatus comprising:
  - a conveying device which conveys a paper sheet along a conveying surface;
  - 5 a detection device which is provided opposite to the conveying surface and detects a paper sheet conveyed by the conveying device;
  - a guide device which is provided in at least the paper sheet take-in side of the detection device and 10 formed with a pair of guide members disposed opposite to each other at both sides of the conveying surface;
  - a nozzle which is provided in the opposite surface of the pair of guide members; and
  - 15 a gas supply device which supplies compressed gas to the pair of guide members and ejects the gas from the nozzle between the pair of guide members.
2. The paper sheet detection apparatus according to claim 1, wherein the guide device is provided in the paper sheet take-in side and take-out side of the 20 detection device.
3. The paper sheet detection apparatus according to claim 1, further comprising a plurality of grooves provided at a certain interval on the opposite surface of said pair of guide members in the paper sheet conveying direction and in the direction orthogonal to the conveying direction, and a plurality of nozzles provided at least in the parts surrounded by said 25

plurality of grooves on the opposite surface of said pair of guide members.

4. The paper sheet detection apparatus according to claim 3, wherein said plurality of nozzles are disposed like a column on the line parallel to the paper sheet conveying direction, and the interval between the outermost nozzle column is set wider than the width dimension of the paper sheet in the direction orthogonal to the conveying direction.

10 5. The paper sheet detection apparatus according to claim 1, wherein one of said pair of guide members consists of a plurality of divided guides divided vertically and horizontally along the paper sheet conveying direction and the direction orthogonal to the conveying direction; and each of the divided guides is provided movable, and has a nozzle to eject compressed gas.

15 6. The paper sheet detection apparatus according to claim 1, wherein one of said pair of guide members consists of a plurality of divided guides divided over the paper sheet conveying direction; each of the divided guide parts has a nozzle to eject compressed gas; the gas supply device controls the supply of compress gas to said plurality of divided guide members by switching the pressure and flow rate to be different at a certain cycle, and moves a pressure fluctuation or a flow rate fluctuation of the compressed gas ejected

from the nozzles of said plurality of divided guides along the paper sheet conveying direction.

7. The paper sheet detection apparatus according to claim 6, wherein the gas supply device generates a pressure fluctuation or a flow rate fluctuation of the compressed air blown out from the nozzle, according to the height or the flow rate increment and decrement of the pressure of the compressed gas supplied to the divided guides.

10 8. The paper sheet detection apparatus according to claim 1, wherein the other one of said pair of guide members is fixedly provided.

9. A paper sheet detection apparatus comprising:  
a conveying device which conveys a paper sheet  
15 along a conveying surface;  
a detection device which is provided opposite to the conveying surface and detects a paper sheet conveyed by the conveying device;  
a guide device which is provided in at least the paper sheet take-in side of the detection device and formed with a pair of guide members disposed opposite to each other at both side of the conveying surface;  
a nozzle which is provided in the opposite surface of the pair of guide members;  
20 an energizing device which elastically energizes one of the pair of guide members toward the other guide member; and

a gas supply device which generates a clearance between the pair of guide members by moving one of the pair of guide members against the energizing force of the energizing device, by supplying compressed gas to 5 the pair of guide members and ejecting the gas from the nozzle between the pair of guide members.

10. The paper sheet detection apparatus according to claim 9, wherein the guide device is provided in the paper sheet take-in side and take-out side of the detection device.

11. The paper sheet detection apparatus according to claim 9, further comprising a plurality of grooves provided at a certain interval on the opposite surface of said pair of guide members in the paper sheet 15 conveying direction and in the direction orthogonal to the conveying direction, and a plurality of nozzles provided at least in the parts surrounded by said plurality of grooves on the opposite surface of said pair of guide members.

20. The paper sheet detection apparatus according to claim 11, wherein said plurality of nozzles are disposed like a column on the line parallel to the paper sheet conveying direction, and the interval between the outermost nozzle column is set wider than 25 the width dimension of the paper sheet in the direction orthogonal to the conveying direction.

13. The paper sheet detection apparatus according

to claim 9, wherein one of said pair of guide members consists of a plurality of divided guides divided vertically and horizontally along the paper sheet conveying direction and the direction orthogonal to the 5 conveying direction; and each of the divided guides is provided movable, and has a nozzle to eject compressed gas.

14. The paper sheet detection apparatus according to claim 9, wherein one of said pair of guide members 10 consists of a plurality of divided guides divided over the paper sheet conveying direction; each of the divided guide parts has a nozzle to eject compressed gas; the gas supply device controls the supply of compress gas to said plurality of divided guide members 15 by switching the pressure and flow rate to be different at a certain cycle, and moves a pressure fluctuation or a flow rate fluctuation of the compressed gas ejected from the nozzles of said plurality of divided guides along the paper sheet conveying direction.

20 15. The paper sheet detection apparatus according to claim 14, wherein the gas supply device generates a pressure fluctuation or a flow rate fluctuation of the compressed air blown out from the nozzle, according to the height or the flow rate increment and decrement of 25 the pressure of the compressed gas supplied to the divided guides.

16. The paper sheet detection apparatus according

to claim 1, wherein the other of said pair of guide members is fixedly provided.

17. A paper sheet detection apparatus comprising:

- a conveying device which conveys a paper sheet along a conveying path;
- a guide device which has a pair of guide members separated and opposed through the conveying path, and passes and guides the paper sheet between said pair of guide members;
- 10 an inspection device which is formed with a wave transmitter provided in on one of said pair of guide members and radiates a sound wave to the conveyed paper sheet, and a wave receiver provided in the other of said pair of guide members, and receives the sound wave passing through the paper sheet;
- 15 a nozzle which is provided in the opposite surfaces of said pair of guide members; and
- 20 a gas supply device which supplies compressed gas to said pair of guide members, and ejects the gas from the nozzles to between said pair of guide members.

18. A paper sheet detection apparatus comprising:

- a conveying device which conveys a paper sheet along a conveying path;
- a guide device which has a pair of guide members separated and opposed through the conveying path, and passes and guides the paper sheet between said pair of guide members;

an inspection device which is formed with a pressure sensor provided in each of said pair of guide members;

5 a nozzle which is provided in the opposite surfaces of said pair of guide members; and

a gas supply device which supplies compressed gas to said pair of guide members, and ejects the gas from the nozzles to between said pair of guide members.

10 19. A paper sheet detection apparatus comprising: a conveying device which conveys a paper sheet along a conveying path;

15 a guide device which has a pair of guide members separated and opposed through the conveying path, and passes and guides the paper sheet between said pair of guide members;

an inspection device which is provided in one of said pair of guide bodies, and inspects the conveyed paper sheet; and

20 a gas ejection device which is provided in the other of said pair of guide members, ejects compressed air to form a static pressure gas layer between said pair of guide members, and presses the conveyed paper sheet to one of said pair of guide members by the static gas layer.

25 20. The paper sheet detection apparatus according to claim 19, further comprising an energizing device which elastically energizes the other guide member

toward one guide member.

21. The paper sheet detection apparatus according to claim 19, wherein the gas ejection device is porous, or has a nozzle hole or a groove-like ejection device.

5 22. The paper sheet detection apparatus according to claim 19, wherein said one guide member consists of a transparent plate.

10 23. The paper sheet detection apparatus according to claim 19, wherein the conveying device has a pair of conveying rollers disposed in the paper sheet take-in side and take-out side of the guide device, and a paper sheet is held and conveyed by said pair of conveying rollers.